

## CLAIMS

What is claimed is:

1. A method of detecting a transmission from a primary cellular transmitter,  
5 the primary cellular transmitter transmitting on at least one channel frequency and being  
located in the vicinity of one or more secondary cellular transmitters, the method comprising  
the steps of:

receiving a first stream of transmission data having a first received  
signal frequency at a first reception location for a first period of time;

10 identifying the first signal frequency of the first stream of transmission  
data;

correlating the transmission data against a signal template to identify a  
first FCCH burst frame;

15 identifying first FCCH time data corresponding to the first FCCH burst  
frame; and

comparing the first signal frequency of the first stream of transmission  
data and the first FCCH time data to a reference file to determine one or more probable  
transmission cells.

2. The method of claim 1, where the reference file comprises data entries  
20 representative of reference signal frequency and reference FCCH time data for a plurality of  
transmission cells.

3. The method of claim 2, wherein the step of comparing the first signal  
frequency of the first stream of transmission data and the first FCCH time data to a reference  
file to determine a probable transmission cell comprises the steps of:

25 identifying each transmission cell in the reference file using  
substantially the same frequency as the first received signal frequency; and

analyzing the reference FCCH time data for each cell using  
substantially the same frequency as the first received signal frequency to determine

transmission cells with reference FCCH time data corresponding to the first FCCH time data.

4. The method of claim 3, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring a multiple of 51 time frames apart from the reference time data.

5 5. The method of claim 3, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 10 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

10 6. The method of claim 3, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 11 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

15 7. The method of claim 3, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 20 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

20 8. The method of claim 3, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 21 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

9. The method of claim 3, further comprising the steps of:  
if more than one transmission cell is identified for which the reference FCCH time data corresponds to the first FCCH time data,  
identifying first geographic location data associated with the  
25 first reception location; and  
comparing the first geographic location data with location data associated with each identified transmission cell to determine a most probable transmission cell.

10. The method of claim 1, wherein the step of identifying first location data comprises receiving location data from a GPS unit.

11. The method of claim 1, where the first period of time is of sufficient duration to record sixty-two frames of transmission data.

5           12. The method of claim 1, wherein the signal template comprises an FCCH Burst and a SYNCH training sequence.

13. The method of claim 1, wherein the step of identifying time data corresponding to the first period of time comprises receiving time data from a GPS unit.

10           14. A system for detecting a transmission from a primary cellular transmitter, the primary cellular transmitter transmitting on at least one channel frequency and being located in the vicinity of one or more secondary cellular transmitters, the system comprising:

                  an RF front end adapted to receive a first stream of transmission data having a first signal frequency at a first reception location for a first period of time;

15                   the RF front end further adapted to identifying the first signal frequency of the first stream of transmission data;

                  a shaper adapted to correlate the transmission data against a signal template to identify a first FCCH burst frame;

                  the shaper further adapted to identify first FCCH time data corresponding to the first FCCH burst frame; and

20                   an analyzer adapted to compare the first signal frequency of the first stream of transmission data and the first FCCH time data to a reference file to determine a probable transmission cell.

15           15. The system of claim 14, wherein the reference file comprises data entries representative of reference signal frequency and reference FCCH time data for a plurality of cells.

16. The system of claim 14, wherein the analyzer is further adapted to:

identify each cell in the reference file that uses substantially the same frequency as the first signal frequency; and

analyze the reference FCCH time data for each cell using substantially the same frequency as the first signal frequency to determine transmission cells with reference  
5 FCCH time data corresponding to the first FCCH time data.

17. The system of claim 16, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring a multiple of 51 time frames apart from the reference time data.

18. The system of claim 16, wherein the FCCH time data corresponds to the  
10 first FCCH time data if the first FCCH time data represents a time frame occurring 10 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

19. The system of claim 16, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 11 time  
15 frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

20. The system of claim 16, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 20 time frames from a time frame occurring a multiple of 51 time frames apart from the reference  
20 time data.

21. The system of claim 16, wherein the FCCH time data corresponds to the first FCCH time data if the first FCCH time data represents a time frame occurring 21 time frames from a time frame occurring a multiple of 51 time frames apart from the reference time data.

22. The method of claim 14, wherein the signal template comprises an FCCH  
25 Burst and a SYNCH training sequence.